ADVANCES IN MATHEMATICS 56, 92 (1985)

Book Reviews

Séminaire Bourbaki, Volume 1981–1982, exposés 579–596, *Astérisque*, 92–93, Société Mathématique de France, Paris, 1982, 389 pp.

N. BOURBAKI, *Espaces vectoriels topologiques*, Chaps. 1–5, Masson, Paris, 1981, 368 pp.

N. BOURBAKI, *Algèbre*, Chaps. 4–7, Masson, Paris, 1981, 422 pp.

N. BOURBAKI, *Groupes et algèbres de Lie*, Chaps. 4–6 and 9; *Algèbre*, Chap. 10 (algèbre homologique, page numbers not clear); *Algèbre commutative*, Chaps. 8 and 9 (page numbers not clear).

Milan has succeeded in beating Paris in women's fashion, but Paris retains the title in intellectual elegance. The finest presentations of today's mathematics are still heard in the halls of the Institut Henri Poincaré, where polite insults are elegantly exchanged with jewels of mathematical definitiveness. Bourbaki has renewed itself without flinching. The volume on homological algebra is a champion of intellectual honesty, defining (as it does *par excellence*) homological algebra as the study of the Koszul complex and its far-reaching analogs.

The earlier chapters on algebra, which Emil Artin criticized in a famous review, have now been enriched by material that the old Bourbaki of the fifties would have found to be too concrete: we thus find such previously forbidden topics as symmetric functions (though not, alas, Schur functions), lattice theory, even a statement of the binomial theorem. The same may be said of the volume on topological vector spaces, now enriched by a detailed study of convexity and by some basic facts on Hilbert space which cannot be found in other treatises, especially tensor products.

The Bourbaki seminars, which are the stockmarket of mathematics, are now edited in the successful series "Astérisque." The format of this series is ideal for present-day mathematics, when it is often impossible to find publication for a paper which dares bring the reader up-to-date on a subject before dishing out the latest results. While we wish the new series the success it deserves, we hope it will resist the onslaughts of Festschrifts and collections of papers presented at conferences, which are all too often hastily drafted by worn-out lecturers.

Bourbaki's commutative algebra volume is a hymn to Witt vectors, complete with Goldberg variations in the form of exercises, probably the most useful single set of exercises ever written. Who would have thought, on reading Witt's tormented paper in *Crelle's Journal*, that this ingenious piece of combinatorics (the author admits that it took him a full year to straighten it out) would creep into the roots of our thinking? In retrospect, that is, after Bourbaki, we realize why this should be so, for Witt vectors achieve the ambitious philosophical project of taking the logarithm of a set.

As for the volumes on Lie algebras, the best can be said (as it can be of the preceding volumes): all the formulas are here. No more panicky searches through the literature. Bourbaki is here.

GIAN-CARLO ROTA
Editor

Printed in Belgium

0001-8708/85 $7.50